

A CASE

The present invention relates to a case for storing and protecting relatively thin objects, such as data carriers of which compact disks, digital versatile disks (DVD) and minidisks represent examples. The case can also be used to store items such as cigarettes. The invention also relates to the manufacture of such a case.

CD carriers, such as the CD jewel case, are usually made of a hard brittle plastic and have several problems associated with them. The cases are not very robust and tend to break or get damaged very easily during use, or get scratched, especially on the front cover surface which is usually made of a clear plastic. Also, the front cover or lid of the jewel case is not very securely attached to the base of the case and tends to detach quite easily. Further, the hinge mechanism holding the lid and the base together is quite fragile and often breaks.

A further problem with prior art CD cases is that the CD is often held on a circular array of deformable teeth which engage the periphery of a hole formed in the centre of the CD. If the teeth break, then the CD may become free to move within the case and thereby scratch the data carrying surface of the CD.

Most CDs come with a booklet providing information, for example, about the songs and the artist. In the presently used CD jewel cases, the booklet is secured on the inner face of the lid by plastic tabs fixed to the under surface of the lid. This makes it very difficult to pull out the booklet from underneath the tabs. Once the booklet is pulled out it is then very difficult to slot the booklet back into position against the lid.

DVD carriers and minidisk carriers which are based on the CD jewel case system also suffer from the problems described above.

According to a first aspect of the present invention there is provided a case for an object, comprising a first portion hingeably attached to a second portion, and a carriage for holding the object, the carriage being movable in response to relative movement of the first portion with respect to the second portion between a first position where the object is held in a

protected space and a second position where the object is presented for removal from the case.

Preferably the first portion forms the front of a case and the second portion forms the rear of a case. However the first and second portions could equally form the top and bottom of the case.

Preferably the first portion is directly hingeably attached to the second portion. This produces a case of a simple and inexpensive design. However, the desire to include promotional material or to create a region where data can be seen, even when the case is stacked with other cases, may result in the first and second portions being separated from one another by an intermediate wall which effectively functions like a spine of a book.

Preferably the carriage is attached to the first portion by a flexible link or by a hinge. The connection between the carriage and the first portion is offset from the hinge connection between the first and second portions. In a preferred embodiment a hinge connection is formed between the carriage and the first portion, and the hinge connection is parallel with the or each hinge interconnecting the first and second portions.

Preferably the protected space is defined, at least in part, by a wall in spaced apart configuration from the second portion, thereby defining a volume or a pocket into which the carriage extends. This has an added advantage that it also holds the carriage adjacent the back portion.

Advantageously at least one of the first or front portion, the second or back portion and carriage is flexible and resilient. Limited flexure of these items is advantageous as it enables the thickness of the case to be minimised or at least kept comparable with existing jewel cases.

The first and/or second portions may be formed with a predetermined depth. This can be partially to give the case a feel of rigidity and volume and also to enhance market acceptance. The first and second portions may have integrally formed or separately added box elements and/or peripheral walls applied so as to define the depth of the case.

Advantageously the case can hold a plurality of disks or other objects simultaneously. This could be achieved by making the case bigger such that two or more disks can be held on a single carriage.

Preferably at least one intermediate element is provided between the first and second portions and is hingeably attached by a further hinge to at least one of the first and second portions. The further hinge is advantageously at or proximate the position of the hinge joining the first and second portions. The intermediate element acts as a rear portion for a first case region formed by it and the first portion, and a front portion for a second case region formed by it and the second portion. Thus one side of the intermediate element defines a protected region for the first case region and has the second carriage hingely attached to a second side thereof at a position offset from its attachment to the front and/or rear portion.

It is thus possible to provide a case for two objects where both objects, such as data carriers, are presented to the user in the same orientation and either can be extracted without the repeated opening out of flaps, as is found in currently used jewel cases. The provision of further intermediate portions enables more CDs, DVDs or the like to be contained within the case.

According to a second aspect of the present invention, there is provided a carrier for a plurality of objects, the carrier comprising first, second and third elements hingeably attached to one another in a first hinge region, and wherein the second and third elements carry first and second protective regions thereon, respectively, for holding an object therein, and wherein a first carriage is attached to the first element by a second hinge offset from the first hinge region and extends into the first protective region, and a second carriage element is attached to the second element by a third hinge offset from the first hinge region and extends into the second protective region.

Advantageously the depth of the spine joining the front portion and the back portion is equal to the sum of the thickness of the object for which the carrier is adapted, the thickness of the front and rear portions and the protective region. It is thus possible to ensure that there is little or no load on the spine when pressure is applied against the major faces (as defined as being perpendicular to the plane of the front and rear portions) of the

carrier. This configuration prevents the carrier from being squashed or crushed under pressure, for example where several carriers are in stacked or side by side configuration.

The carriage may be provided with a means to lift or hold the object off from the surface of the carriage portion in order to protect the playing surface or the information carrying surface from being damaged when the object is a data carrier such as a CD, DVD, minidisk or the like.

Conveniently, the case is provided with a second pocket or other holding means to hold additional articles such as a booklet relating to the CD, or business cards. For example, there may be a pocket in or on the front portion of the carrier in which the booklet fits or there may be tabs inside the front portion to hold the booklet in position. The pocket may be provided with a stopping means such as one or more internal projections to prevent the booklet from sliding down into the case.

The case may be provided with a lock to hold it closed. The lock may be formed by a tab on the front cover and a loop on the back cover into which the tab fits when the case is closed. Other arrangements are clearly within the knowledge of the person skilled in the art.

Preferably, the case is made of flexible paper or card. The paper or card may be reinforced by a plastic film or alternatively the case may be made of a flexible plastic material. Use of plastic or paper reinforced by a plastic film may also enhance the resistance of the case to the presence of water or other liquids.

It will also be appreciated that the case can be designed in any size, or shape or configuration to suit the object to be carried or to meet any marketing needs. Thus, for example, if the case is being made to carry a DVD, the shape of the case can be an oblong shape to match the size and shape of current DVD carriers. Similarly the carriage can be adapted to convey other high volume or promotional items, such as keys, precious stones and so on. The case can also be adapted to be a convenient package for items such as cigarettes and pharmaceutical products.

According to a third aspect of the present invention there is provided a blank comprising: a first panel connected to a second panel; a third panel connected to the second panel such that the third panel can be folded over the second panel to form a protected region; a carriage panel connected to a pocket panel such that the pocket panel can be folded over the carriage panel to form a pocket; and an intermediate panel connected to the carriage panel, and wherein the intermediate panel joins the first panel along a boundary that is not parallel to the connection between the first and second panels.

The invention will now be described, by way of example only, with the reference to the accompanying drawings in which,

Figure 1 schematic diagram of a case constituting an embodiment of the present invention when in an open configuration;

Figure 2 shows the carriage of the embodiment of figure 1 in greater detail;

Figure 3 is a cross section along the line A-A' of figure 1 of the case when in a closed configuration;

Figure 4 is a cross-section through the case showing it in a partially opened configuration;

Figures 5a and 5b show plan and cross-section views, respectively, of a modified carriage;

Figure 6 is a cross-section through a double CD case constituting an embodiment of the present invention;

Figure 7 is a cross-section through a single DVD case constituting an embodiment of the present invention;

Figure 8 is a cross-section through a double DVD case constituting an embodiment of the present invention;

Figure 9 is a schematic drawing of an unassembled carrier constituting and embodiment of the invention;

Figures 10a, 10b and 10c illustrate a cigarette packet constituting an embodiment of the present invention;

Figure 11 is a plan view of a modified blank;

Figure 12 is a close up of the carriage portion of a further blank constituting an embodiment of the present invention; and

Figure 13 is a plan view of a blank for a business card holder constituting an embodiment of the present invention.

Figures 1 to 4 schematically illustrate a case constituting a first embodiment of the present invention. As shown in figure 1, a front panel 2 is attached to a rear panel 4 via a hinge region 6. The front and rear panels 2 and 4 may be made from a single sheet of material and the hinge 6 may simply be formed by a fold between the panels 2 and 4. However, the hinge region 6 may comprise first and second hinges connecting the front panel 2 to a wall portion, and the wall portion to the second panel 4, respectively, as shown in greater detail in figure 3. The rear panel 4 carries a protective region 8 in which the object enclosed by the case is normally located. The protective region 8 may be formed by a further sheet 10 of material attached to the second portion 4 at a peripheral region thereof, or attached to the second portion 4 by intermediate walls 12, as shown in figure 3, in order to form a pocket.

A carriage 14 is attached to the front portion 2 at a hinge region 16. The hinge regions 6 and 16 are parallel with each other but laterally offset with respect to one another. The hinge region 16 may be formed as two hinges 18 and 20 disposed either side of an interconnecting wall 22. The hinges 18 and 20 may easily be formed by folds in the material constituting the carriage 14. The carriage carries a pocketed region 24 thereon which is defined by a further sheet of material 26 which is disposed above the carriage 14 and is joined therewith along an end portion 28. The pocket 24 serves to hold the object, such as a CD, thereby ensuring that the CD moves with the carriage 14. For ease, the further sheet 26 may simply be a folded back portion of a sheet of material forming the carriage itself.

Figure 3 shows the case in the closed configuration. Thus the end of the carriage 28 is disposed towards an end wall 12 of the case. The CD is therefore held almost entirely within a protected region. However, when the case is opened the carriage slides out of the protected region in order to present the object for removal. Figure 4 illustrates the case in a partially opened configuration. It will be appreciated that when the case is fully opened the front portion 2 lays substantially in the same plane as the rear portion 4. During the opening process, the front and rear portions 2 and 4 pivot with respect to one another around the hinge 6 which in this example is a composite hinge formed of two hinges separated by an intermediate wall. Comparing the position of the second hinge 16 with respect to the first hinge 6, it can be seen that in figure 3 the second hinge 16 lays between the first hinge 6 and the end wall 12, that is to the right of hinge 6 as shown in figure 3; whereas in figure 4 the hinge 16 is moving away from that position and when the case is fully opened the second hinge 16 will lie to the left-hand side of the first hinge 6. This repositioning of the hinge 16 from one side of the main hinge 6 to the other side thereof is transmitted to the carriage 14 and hence causes the carriage 14 to become partly withdrawn from the protective region 8. This in turn moves the object, such as the CD to a position where it can be grasped and removed from the case.

Returning to figure 1, it can be seen that a cutaway 40 is formed in the upper surface of the protective region 8, and cutaway 42 is formed in the upper surface 26 of the carriage 14. When the case is in the open configuration, these cutaways align allowing a user to reach through these regions and to place their finger in the central hole which is formed in CDs and similar data carriers. This facilitates the extraction of the data carrier from the case.

Figures 5a and 5b schematically illustrate a modification to the carrier in plan view and a cross section, respectively. A disk shaped projection 46 is disposed on the carrier 14 in such a position that it will align with the central portion of a CD or other data carrier when the CD is held within the case. The projection 46 serves to ensure that the data bearing portion of the disk does not abut directly with the material of the carrier 14. In a further embellishment, a second projection of a small diameter may be centrally disposed on the first projection 46 so as to partially or fully extend through a central hole within the data carrier in order to secure it in position. However, it is expected that this feature will not be often used in practice as the dimensions of the pocket are such that the periphery of the

data carrier is in close proximity to the side walls of the pocket and hence the carrier is not free to slide about therein.

Figure 6 is a cross section through a double case constituting an embodiment of the present invention. Parts of the case shown in figure 6 are very similar to parts of the case described with reference to figures 1 to 4 and like reference numerals would be used for like parts where appropriate. The case shown in figure 6 has a rear portion 4 which carries a protective region 8 in the form of a pocket thereon. A front panel 2 is hingeably connected to the rear panel 4 via a hinge region 6 which comprises first and second hinges 50 and 52 formed either side of an immediate wall 54 which itself may optionally have a centrally disposed hinge region 56. An intermediate panel 60 is provided which is hingeably attached to the back panel 4 at a hinge region generally indicated 62. A carriage 14 of the type disclosed hereinbefore is hingeably attached to a rear surface 63 of the intermediate element 60 via a hinge 64 which is laterally displaced from the hinge region 6. The intermediate element 60 also carries a protective region 8' on a side thereof facing towards the front panel 2 when the case is in a closed configuration. A further carriage 14' is associated with the intermediate panel 60 and the further carriage 14' is hinged to the front panel 2 at a hinge 66 which is also offset from the hinge region 6. Thus data carriers can be inserted or removed from either protective region 8 or 8' by opening the carrier in much the same manner as one opens a book to reveal the correct page.

The front cover 2 may in fact be formed by two sheets of material 70 and 72 connected together at their periphery, but having one open end 74 to form a slot through which a data card or booklet may be pushed in order to hold it securely between the covers. An end stop 74 is formed in order to prevent the booklet progressing too far into the space between the sheet 70 and 72 and thereby becoming inaccessible. Cut outs provided in the region of the slot 74 in order to facilitate manual grasping of the data card in order to retrieve it.

The market for CDs and DVDs has developed such that DVDs are presented in thicker cases although there is no intrinsic technical reason for doing this. Figures 7 and 8 schematically illustrate cross sections through embodiments of the present invention which are deliberately formed so as to be thicker in order to facilitate acceptance of the invention for storage and transport of DVDs. In order to facilitate the extra thickness box sections



are formed in order to increase the depth of the case. Each of figures 7 and 8 is a cross section through the central portion of the case, and hence end walls would close the sections that are illustrated. Hinge regions are represented by the dots 80. Construction is otherwise similar to that described with reference to the CD cases in figures 1 to 6.

Figure 9 illustrates an unassembled version of the carrier in figure 1, showing dotted lines where the folds are made such that when folded the assembled carrier is formed. The solid lines show where the cuts are made. The carrier can be formed out on a single sheet of material, such as flexible card and folded at the indicated positions to provide the assembled carrier. Thus a first panel region 2 is attached to a second panel region 4. One or more scores may be made in the card (or other suitable material) to define hinges. In this example two scores have been made to define hinges 160 and 162. The second panel is also attached to a third panel 10 which in use is folded over the second panel 4 to form the protected region. The third panel 10 is advantageously positioned on the opposite side of the second panel 4 to the first panel 2 as this makes the manufacture of the product easier to automate given the restricted range of automated folds that can be reasonably easily made on a production line.

The carrier portion 14 is attached to a further portion 24a which in use is folded over the carriage portion 14 to form the pocket 24. To provide an easily manufacturable product the carriage is also attached to a further panel 113 which itself is attached to the first panel 2 along a fold line 115 which is perpendicular to the fold line 160.

During manufacture the panel 113 is folded over (along fold 115) to lie against the first panel region 2. The panels 113 and 2 can be adhered together. However, more beneficially a further flap 116 hingeably attached to the first panel region 2 along a fold line 118 opposite the fold line 115 is provided such that the flap 116 can be adhered to the panel 113 to hold it in the folded position and in so doing a pocket is formed between the panels 2 and 113. Furthermore an end stop can be defined in the pocket by providing a booklet stop tab 122. Thus if the flap 116 is folded over to lie against the panel 2 and the stop tab 122 is adhered to the panel 2, and then the portion 113 is folded over and adhered only to

the flap 116 a pocket having an internal obstruction to stop items such as CD album inserts falling out of the hinge end of the pocket is provided.

The carriage 14 is cut such that it is slightly smaller in width than the inside front cover 113 at positions 130 and 132. Folding along the dotted lines 18 and 20 forms the hinge for the carriage 14. The carriage 14 and the inner disc pocket 24 are cut at an angle as shown in figure 9 to substantially match the shape of a CD when the inner disc pocket 24 is folded at hinge 28 onto the carriage 14. The hinge 28 is provided with a slot 134 therein which helps to hold the CD in place. The outer disc pocket 10 is folded along the dotted lines 140, 142 over the back cover 4. Flaps 152 and 154 are folded about the lines 144, 146, 148 and 150 and are glued to the upper surface of the back cover 4 to form the pocket. The whole assembly is then folded along the dotted lines 160 and 162 to form the hinge to open and close the carrier.

The principles of the present invention can be applied to cases for other items, such as cigarettes. An example of a cigarette packet constituting an embodiment of the present invention is shown in Figures 10a, 10b and 10c. Figure 10a shows a packet in a generally closed configuration. The packet comprises a lid 200 which is hingeably attached to a base 202 along a hinge line 204. The cigarettes are held in a carriage 206 which is connected to the lid via an arrangement comprising folds in cardboard extending from the upper end of the carriage 206 in order to define a first hinge 208, a second hinge 210 and an intermediate wall 212. The hinges 208 and 210 are offset from the hinge 204 between the lid 200 and the base 202 in such a way, as shown in Figure 10c, that the opening of the lid in parts motion to the carriage 206 from the bottom of the cigarette packet and lifts the cigarettes up for easier extraction.

Figure 11 shows a further blank constituting an embodiment of the present invention. The blank is in many ways similar to that shown in Figure 9. However the panel 14 is cut to have thinned region 220 and additional tabs 222 and 224 are formed on the second panel 4. The tab 222 has, in this example, been cut such that it never overlaps with the back panel 14 in the finished case, irrespective of whether the case is open or closed. However the panel 224 has been formed longer such that it always overlaps with the carriage 14 irrespective of whether the case is open or closed. During manufacture of a CD case from

this blank, glue is initially applied to the stop tab 122 and then the flap 116 is folded over such that the stop tab 122 is adhered to the front cover 2. A glue line is then placed along the upper exposed surface of the flap 116 and the portion 113 is then folded over the front cover 2 in order to adhere to the flap 116. Next the tabs 222 and 224 are folded over to lie against the back cover 4 and a glue line is then placed on their upper surfaces. At this stage the carriage 14 is also lying over the back cover 4. Next the folding operation is performed which simultaneously causes the third panel 10 and the further portion 24a to fold about their respective hinge lines thereby forming the carriage and pocket within the protective region.

Figure 12 schematically illustrates the carriage 14 and further portion 24a in greater detail for a modified variant of the invention. In this embodiment, during production of the blank embossing is also performed such that the shaded areas 230 and 232 stand upwardly of the blank. Formation of such embossed regions is easily performed by a person skilled in the art. A glue line is also placed over the regions 230 and/or 232 such that when the portion 24a is folded over the panel 14 the regions 230 and 232 interengage and adhere together thereby holding the panel 24a slightly apart from the panel 14 to form a three dimensional pocket.

Figure 13 illustrates a blank for a business card wallet constituting an embodiment of the present invention. For brevity, parts thereof analogous to parts within Figure 9 have been given the same reference numerals. However intermediate walls of increased depth are formed between the front and back panels 2 and 4, and also between the back panel and the third panel 10, and the flaps 152 and 154. Cuts 240 are formed in the panels 152 and 154 such that the panels can be slid into one another to mechanically interengage thereby avoiding the use of adhesive, although of course adhesive can still be used to manufacture this product.

In further variations, double or triple data carrier cases can be manufactured by placing two or more single data carrier cases together with suitable gluing to form them into a composite product. Thus if two single CD cases are used to form a double CD case, then if one case is stacked on top of the other case, then the bottom surface of the uppermost case

is adhered to the top most surface of the lowermost case. Both cases can then be further shrouded by a simple cardboard sleeve, much like the cover of a book, if desired.

Although the invention has been illustrated with carriers for CDs, DVDs and minidisks, it will be appreciated that the invention can be used to carry other objects. Also, the hinge mechanisms of the invention can be applied to display other articles, features, objects in the carrier according to the invention.